

**Study  
Report  
2000-01**

## **Integration of Training Development Among Schools and Distributed Training Environments**

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**United States Army Research Institute  
for the Behavioral and Social Sciences**

**December 1999**



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**U.S. Army Research Institute  
for the Behavioral and Social Sciences**

**A Directorate of the U.S. Total Army Personnel Command**

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Human Resources Research Organization  
Litton-PRC

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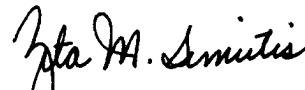
## FOREWORD

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The U.S. Army is rapidly fielding new systems while training development resources are increasingly constrained. One outcome of this is that training development is becoming increasingly distributed, i.e. performed by agencies other than U.S. Army Training and Doctrine Command (TRADOC) proponent schools. Recognizing this situation, TRADOC representatives requested that the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) undertake a study and analysis effort to examine issues in and approaches to distributed training development activities. Based on extensive experience in innovative training development methods, ARI's Armored Forces Research Unit (AFRU) at Fort Knox, Kentucky, performed the study effort.

This final study report describes issues and needs associated with distributed training development activities, along with alternative courses of action for addressing them. The AFRU accomplished this study effort as part of Work Package 205, "Assessment of Force XXI Training Tools and Techniques." The work was supported through a Memorandum for Record between the Chief, ARI AFRU, and the Director, Training Development and Analysis Activity, Deputy Chief of Staff for Training, TRADOC, subject: Integration of Training Development Among Schools and Distributed Training Environments, dated 30 November 1998.

The results and recommendations of this study effort were briefed to the TRADOC Study Advisory Group at Fort Monroe, Virginia, and to other senior TRADOC personnel at Fort Eustis, Virginia; Fort Knox, Kentucky; and Fort Hood, Texas in late August and early September 1999. Training developers and managers throughout TRADOC and other Army agencies can use these results and recommendations to establish policy and procedures for future distribution of training development activities. This should be particularly useful in supporting the rapid fielding of new, largely digital systems.

  
ZITA M. SIMUTIS  
Technical Director

## ACKNOWLEDGEMENTS

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The project team for this study was composed of members of the Human Resources Research Organization (HumRRO) Advanced Distributed Training Program and Litton PRC located at Fort Knox, Kentucky, and Killeen, Texas. Ms. Charlotte Campbell, HumRRO Program Manager for the Advanced Distributed Training Program was the Program Manager for this study. Her contributions to this study went far beyond project supervision. She was involved in all project decisions, served as the team's Research Psychologist and was a reviewer of this report. Mr. Michael Flynn, Litton PRC Fort Knox site manager, served as the team's Army Training Information Management Program (ATIMP) advisor and was also a reviewer of this report.

The contracting officer's representative (COR) for the project was Dr. Billy Burnside from the Armored Forces Research Unit (AFRU), U.S. Army Research Institute for the Behavioral and Social Sciences, at Fort Knox. Dr. Burnside was an active member of the project in all aspects of the study, providing input and counsel throughout. Also from AFRU was Ms. Dorothy Finley, who served as the project Assistant COR and provided a working liaison to the project team. Ms. Finley was also actively involved in all phases of this study. Her comments and insight were of great assistance to the study effort.

The issues, needs, and courses of action developed in this study were reviewed by a study advisory group (SAG) which consisted of members of the U.S. Army Training and Doctrine Command (TRADOC) Office of the Deputy Chief of Staff for Training (including Training Development Analysis Activity and Collective Training Directorate), Army Training Support Center, Armor Center Directorate of Training and Doctrine Development (DTDD) and Warrior-T staffs. The SAG reviewed all project deliverables and provided guidance to the study team on various issues. The members of the SAG for this study were: Dr. Diana Tierney (TRADOC), Ms. Mary Lou Carberry (TRADOC), Dr. William Melton (TRADOC), and Dr. Robert Bauer (Armor Center DTDD). Ms. Frances (Jean) Taylor (Warrior-T) also provided valuable comments on various project deliverables. Several members of the SAG also reviewed portions of this report.

Ms. Kathy Horn of Litton PRC's Fort Knox office provided invaluable word processing support and editing assistance to the study team.

# INTEGRATION OF TRAINING DEVELOPMENT AMONG SCHOOLS AND DISTRIBUTED TRAINING ENVIRONMENTS

## EXECUTIVE SUMMARY

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### Study Requirements:

The U.S. Army's fielding of digital information systems, and the training challenges that have ensued have caused the Army to re-look its established system for training development. The current system, which is based on training development being performed primarily at U.S. Army Training and Doctrine Command (TRADOC) proponent schools and other training development (task) proponents, is presently stressed by requirements such as military occupational specialty changes, new staffing responsibilities, and resource decrements. It is thus not able to meet the training development needs of units receiving digital equipment. This has necessitated a movement towards the development of training at sites other than at proponent schools. Acting on a request from the Deputy Chief of Staff for Training, TRADOC, the U.S. Army Research Institute for the Behavioral and Social Sciences initiated a study to identify the issues and needs associated with distributed training development activities. Additionally, the study identified, analyzed and compared specific courses of action (COAs) for addressing distributed training issues and needs. Development and use of distributed training development techniques is necessary to meet the training development requirements ensuing from the rapid fielding of digital information systems.

### Procedure:

Using the Warrior-T training development cell established within the Central Technical Support Facility at Fort Hood, Texas, and the U.S. Army Armor Center and School as exemplar organizations, the study team conducted extensive structured interviews in order to identify the issues and needs associated with distributed training development. These interviews were conducted with subject matter experts (SMEs) from TRADOC Headquarters, the Army Training Support Center, the Fort Hood Warrior-T Office, contract training developers working on behalf of several of the materiel developers fielding equipment at Fort Hood, several Program Managers, TRADOC Systems Managers for digital information systems, and representatives from the Armor Center's Directorate of Training and Doctrine Development. The project staff analyzed the identified distributed training issues and needs, then developed COAs to address them. The COAs were then analyzed and compared and the near- and long-term implementation considerations were examined. As a result, viable COAs for possible implementation in the near- and long-term were provided.

### Findings:

Five issues along with five corresponding needs associated with distributed training development were identified. These issues and needs served as the basis for the development, analysis, and comparison of four COAs.

The five identified issues and corresponding needs were:

1. Issue: Distributed training development activities and the five phases of Systems Approach to Training (SAT)

Need: A requirement exists for a clear definition of which SAT phases should be distributed, to whom they should be distributed, and how this should be done. Distribution of all phases of SAT can take advantage of technology-based solutions.

2. Issue: Varying approaches to training development

Need: Meeting needs for effective Army training products requires adherence to a development process, like SAT, that is known to be effective and is reasonably standardized. These needs include the fielding of new systems.

3. Issue: Distributed training development tools, agencies, and information flow

Need: A complete management system architecture, which includes hardware, software, policy, and regulatory guidance, is needed to facilitate the interaction among all Army organizations involved in training development. This system should also facilitate the accessing of off-site SMEs during training development activities.

4. Issue: Distributed training development activities in support of unit requirements

Need: Units need additional training tools specific to their needs such as the Commanders' Integrated Training Tool (CITT). Unit leaders also need training in appropriate portions of the SAT process.

5. Issue: Future requirements for distributed training development activities

Need: A flexible and responsive training development capability should be available to support short-term surge requirements and possibly training development backlogs.

The four COAs developed as a result of the analysis of identified issues and needs were:

- Maintain the status quo
- Establish additional Warrior-T Offices
- Establish a mobile surge team capability
- Integrate training development activities into unit set fielding

Each identified issue and need was accompanied by an extensive analysis. The COAs were analyzed and compared in detail and near- and long-term implementation considerations were addressed and analyzed. Although the report did not recommend implementation of a specific



COA, analysis suggested that the COA that included a mobile surge capability was the most viable.

#### Utilization of Findings:

This report identifies key issues and needs associated with distributed training development activities, along with alternative COAs for addressing them. The findings can be used by training managers and developers throughout the TRADOC community to establish policies and procedures for future distribution of training development activities. The findings should be especially applicable for training development associated with the rapid fielding of new, largely digital systems.

# INTEGRATION OF TRAINING DEVELOPMENT AMONG SCHOOLS AND DISTRIBUTED TRAINING ENVIRONMENTS

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## INTEGRATION OF TRAINING DEVELOPMENT AMONG SCHOOLS AND DISTRIBUTED TRAINING ENVIRONMENTS

### Introduction

The U.S. Army's fielding of digital information systems and the training challenges that have ensued have caused the Army to re-look its established system for training development. The current system, which is based on training development being performed primarily at U.S. Army Training and Doctrine Command (TRADOC) proponent schools, is presently stressed by requirements such as military occupational specialty changes, new staffing responsibilities, training developer reductions, and other resource decrements. It is thus not able to meet the training development needs of units receiving digital equipment. This has necessitated a movement towards the development of training at sites other than at proponent schools. Additionally, plans and concepts for the future of the Army and Army training (Department of the Army [DA], 1999c) suggest the need for a more integrated training development system in which units, TRADOC, proponents (schools), and other agencies such as Project Managers (PMs) and Combat Training Centers (CTCs) are linked and share selected responsibilities within the training development process. Throughout the rest of this report the use of the term proponent will include schools and all other organizations and agencies with training (task) development responsibility.

Evolving technology and new training management and development strategies may facilitate integration, but they may also create new challenges. First, under the Total Army Distance Learning Program (DA, 1999c), TRADOC proponents and PMs are increasingly responsible for exporting training and managing distributed training networks while significant responsibility for management of individual skills training shifts to units. Second, current and evolving strategies for new equipment fielding (such as digital systems) are impacting the training development process. Use of rapid acquisition and spiral development (rapidly developing, testing, and refining) strategies have resulted in fielding of numerous versions of digital equipment to units before the objective system is fielded and before TRADOC schools are able to develop the necessary training (Ford, Campbell, & Cobb, 1998). Third, units need standardized but tailorable training and training support packages (TSPs) to support collective training exercises and mission rehearsal (Ford et al). This need is evident today as units attempt to modify available TSPs to meet their unique operational requirements.

A thorough and detailed system of training development management is mandated by TRADOC Regulation 350-70 (DA, 1999c), which also suggests distributed training development requirements in its Army XXI training development vision. Therefore, examination of this need for increasingly distributed training development and efficient means for managing it is a high near-term priority for TRADOC. To meet the challenges described above (primarily the second one, dealing with rapid fielding of new equipment), the TRADOC Deputy Chief of Staff for Training (DCST) established the Warrior-T Office within the Central Technical Support Facility (CTSF) at Fort Hood, Texas. The objective of this office is to assist in the capture of doctrine; tactics, techniques, and procedures; and training lessons learned relating to individual and collective (including battle staff) tasks for selected digital systems. The Warrior-T Office works closely with materiel developers to bridge the doctrine and training gap for newly fielded digital

systems until unit and institutional training for those systems is in place. This office provides the capability to augment training development at Fort Hood, to capture lessons learned and provide feedback to TRADOC proponents and other agencies (e.g., PMs for digital systems), and to ensure standardization of TSPs. TRADOC's stated intent is that this capability (and associated resources) will eventually migrate to PMs and TRADOC schools. The Warrior-T Office therefore provides an interim solution to distributed training development challenges (U.S. Army Research Institute for the Behavioral and Social Sciences [ARI], 1998).

The establishment of training development cells in distributed training environments (such as the Warrior-T Office at Fort Hood) is resource-intensive and is not seen as a viable long-term approach for meeting distributed training development requirements. Alternative, more efficient approaches or courses of action (COAs) are needed. Development of such COAs requires a study of the fundamental needs for an integrated training development system among proponent schools, units, CTCs, and PMs for new equipment/systems.

As a result, the TRADOC DCST initiated an ARI study to identify the needed functions of an integrated training development system, such as quality control through two-way communication or feedback between TRADOC schools and units on school- and unit-developed products. Additionally, there was interest in investigating available or emerging training development or management tools and methods associated with integrated training development systems.

This report presents the findings of the ARI study entitled "Integration of Training Development Among Schools and Distributed Training Environments (ITDATE)."

### Scope of the Study

The overarching objective for this study was to examine and describe issues and needs relating to integration of training development activities among TRADOC schools and distributed training environments. The study focus was to be primarily on the current and near-term distributed training development needs of Fort Knox, Kentucky, and Fort Hood, Texas. Once near-term issues and needs were identified, guidelines and recommended COAs were to be developed as exemplars to address them. The study was also to identify potential strengths and weaknesses of the COAs developed, along with identifying organizational, personnel, or policy issues for both current and future (Army Training XXI) environments. In addition, it was to investigate available or emerging training development or management tools and methods associated with effective and efficient management of an integrated training development system (such as Automated Systems Approach to Training [ASAT]), as well as research and development requirements for new tools or methods. The end result would be information and recommended COAs that would enable TRADOC DCST to do the necessary anticipatory planning for an integrated training development system, ensuring complementary and not duplicative institutional and unit training programs. Finally, the study findings were to be generalized or extended to address long-term needs and approaches for integrating distributed training development throughout the Army training system.

## Report Organization

This report summarizes an effort that explored many facets of a complex issue. It is intended to provoke thought, discussion, and activity. It begins with a short background section to set the context of the study. The methodology then describes the project activities. The products of the study are presented in the results section, under the following headings: Issues and Needs, Courses of Action, Course of Action Analysis, and Analysis Results. The discussion section presents some considerations associated with implementation of each COA. These topics are followed by four appendixes containing an acronym list and a glossary (Appendix A), a complete discussion of the issues and needs (Appendix B), selected interview responses (Appendix C), and related readings (Appendix D).

## Background

### Overview of the Army Training Development System

The U.S. Army uses the Systems Approach to Training (SAT) as its training development model. TRADOC Regulation 350-70 describes SAT as a "systematic spiral approach to making collective, individual and self development training decisions for the total Army" (DA, 1999c, p. ES-4). The SAT process consists of five training related phases: analysis, design, development, implementation, and evaluation. It should be noted that these phases need not be performed sequentially. In fact, the normal training development process for a new training requirement generally begins with the identification of a perceived training requirement, which is often a product of the evaluation phase of SAT. Figure 1 depicts the interrelationships among phases.

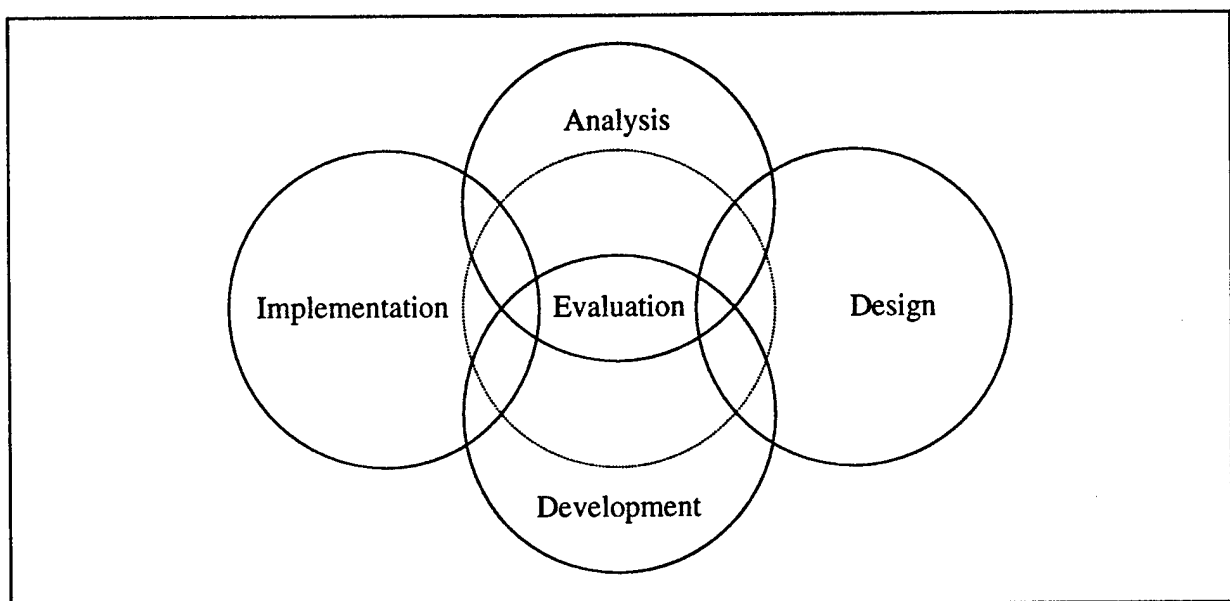


Figure 1. Interrelationships among Systems Approach to Training phases.

In addition to SAT, the Army also uses two automated training development and management tools to assist in the training development process. These are ASAT and the Standard Army Training System (SATS). These tools are also used to help distribute training products that have already been developed and give users a tool to assist them in their training development and management efforts.

ASAT is a management and information system that provides total task management and development capability. It is primarily intended for use by proponent school training developers, but it has functions, such as Combined Arms Training Strategies (CATS), that could be used by units. The ASAT software provides the capability to link information from a designated type of unit to mission, battlefield operating system (or Army Universal Task List), echelon, training products, references, doctrine, and collective tasks. The collective tasks are linked to individual tasks. The individual tasks are linked to other information elements, including occupational specialties, courses, jobs, products, and categories. Essentially any query against Army task information can be accomplished using the software. Application of ASAT is integrated with the Automated Instructional Management System-Redesign (AIMS-R) and SATS. The integration with AIMS-R is intended to provide a seamless link of task information to the automated creation of resident course instruction. The link with SATS supports Warfighter XXI capabilities as outlined in the campaign plan (DCST, 1996) including the future build of TSPs and CATS by the proponent in ASAT, distributed for use by the commander via SATS. Essentially, ASAT is the foundation tool (Army Training Support Center [ATSC], 1999a).

SATS is a computer-based system that is the trainer's management tool to provide a "unit specific" situational training template and aid in the management of training. SATS is based on CATS and implements U.S. Army training management doctrine described in Field Manual (FM) 25-100, Training the Force; FM 25-101, Battle Focused Training; and FM 100-5, Operations (DA, 1988, 1990, 1993). SATS is designed to save the trainer time and manpower. SATS provides the training resource manager a tool to capture usage and cost of training resources for use in budgeting, management, and programming of training resources (DCST, 1998).

#### Distributed Training Development

The term "distributed training development" is not referred to nor has it been defined either in Army Regulation (AR) 350-1 (DA, 1983, 1999e) or TRADOC Regulation 350-70 (DA, 1999c). Although interview information indicated that a similar term had been considered by TRADOC personnel some time ago (see Appendix C), initially the lack of a formal definition caused a problem for the ITDATE study team since it would be critical for study participants to understand what distributed training development was and, more importantly, what it was not. This required consultation with the ARI contracting officer's representative (COR) and the Study Advisory Group (SAG), which consisted of three individuals from TRADOC DCST and one Armor School representative. After this coordination the study team developed a functional definition for the distributed training development concept: *"A process, or activity, in which selected phases of the Systems Approach to Training (SAT) process, or actions in support of the SAT process, are performed at more than one location with the guidance and oversight of appropriate U.S. Army Training and Doctrine Command (TRADOC) proponents. Information*

*and products associated with this process can be exchanged using electronic technology (e.g., the Internet) and other means.”* (See glossary in Appendix A.) It should be noted that, although some training products are distributed or exchanged using distance learning technology, distributed training development is not synonymous with distance learning.

Currently, the responsibility for developing training and distributing it to users in the field rests primarily with the various proponents. The proponents are ultimately responsible for the conduct of all phases of the SAT process to include continuous evaluation of the training products they have developed.

While the proponents have the primary responsibility for developing training; they are not the only agencies developing training. In today's environment of rapid fielding of new equipment there are several other groups involved in the training development process. Two key groups are the PMs for the fielded systems and the end users of those systems. The PMs have the responsibility for developing and distributing training products associated with individual training required to operate their particular systems. They do not, however, have an “in house” capability to develop training. In order to meet their training requirements, many materiel developers outsource or contract for their training development needs. In some cases, such as digitization, the users of newly fielded systems have also found it necessary to develop their own collective training. Unfortunately they do not have either an organizational capability or the time to develop training. Additionally, when funds are reduced training development for new systems is often eliminated. Therefore, they require tools that allow them to access and modify already developed training products to assist them with their training development requirements. Distributed training development seems to be a viable alternative to assist them.

#### Warrior-T Office

With the rapid fielding of digital information systems at Fort Hood, combined with the previously mentioned decrements of training development resources, the proponents soon found that it is difficult to support the training requirements associated with those new systems. Recognizing that TRADOC had this responsibility, the DCST decided to establish a temporary, on-site, training development organization at Fort Hood. This organization was designated as the Warrior-T Office. The Warrior-T Office's stated mission is to “ensure Army Modernization Training supports the objectives of Force XXI by leveraging [Program Executive Office Command, Control, and Communications Systems] PEOC3S, PM, 4 [Infantry Division] ID/III Corps experience and knowledge in assisting PMs and proponents in incorporating digital lessons learned, improving interaction among training, combat and materiel developers, and delivering quality, standardized, timely doctrine and training to soldiers” (ATSC, 1999b). It was staffed with military subject matter experts (SMEs), TRADOC civilian employees, and contract training developers. This organization is led by a lieutenant colonel (LTC) and is divided into three teams: combat arms, combat support and combat service support, and a multimedia team.

Much of the Warrior-T Office's day-to-day work is done in support of agencies such as proponent schools and PMs. Its current taskings include the collection and documentation of digital tactics, techniques, and procedures, and the documentation of individual and collective tasks associated with systems such as Advanced Field Artillery Tactical Data System



(AFATDS), All Source Analysis System (ASAS), and Maneuver Control System (MCS). The office is collocated with materiel fielding assets at Fort Hood's CTSF in order to allow training developers access to both the materiel developers and to end users. This establishes the conditions for the Warrior-T Office to develop more effective training focused on identified user needs and facilitates the evaluation and spiral development processes necessary to ensure that training products remained current as new versions of equipment and software are being fielded. This office has been operational since September of 1998 and is under the operational control of the ATSC. Figure 2 depicts the Warrior-T Office organization.

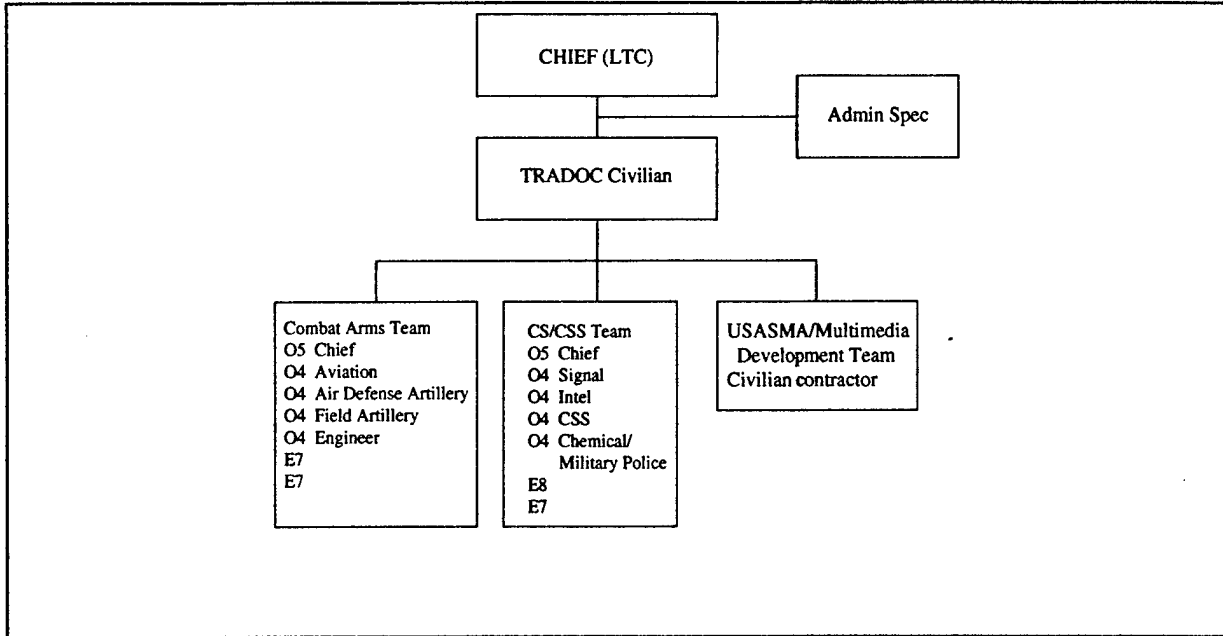


Figure 2. Warrior-T Office organization.

### Methodology

The findings of this study were developed and refined with regard for the parameters within which the Army must operate, now and in the near future. While Army training development resources are decreasing and military and civilian training developers are being downsized, training development requirements are increasing, technologies are changing rapidly, and units are being deployed to increasingly complex operating environments.

The impact of these factors on the Army training development system results in the requirement to do more with less. The TRADOC proponent schools are facing, and will continue to face, sizeable cuts in their training development resources. Units are likewise confronted with increasing operational requirements, decreasing resources, and the requirement to quickly master the new equipment, roles, and responsibilities.

The contributors to this study were cognizant of these constraints. Options requiring high dollar expenditures, large increases in manpower levels, or inordinate time requirements were considered unsuitable and unrealistic.

To examine the integration of training development among proponents and distributed training environments, the study team used two approaches: examination of existing documentation relating to distributed training development, and collection of input from SMEs. The process used to complete this study is depicted in Figure 3 and is described in detail below. The COR and SAG were actively involved in each step of the study.

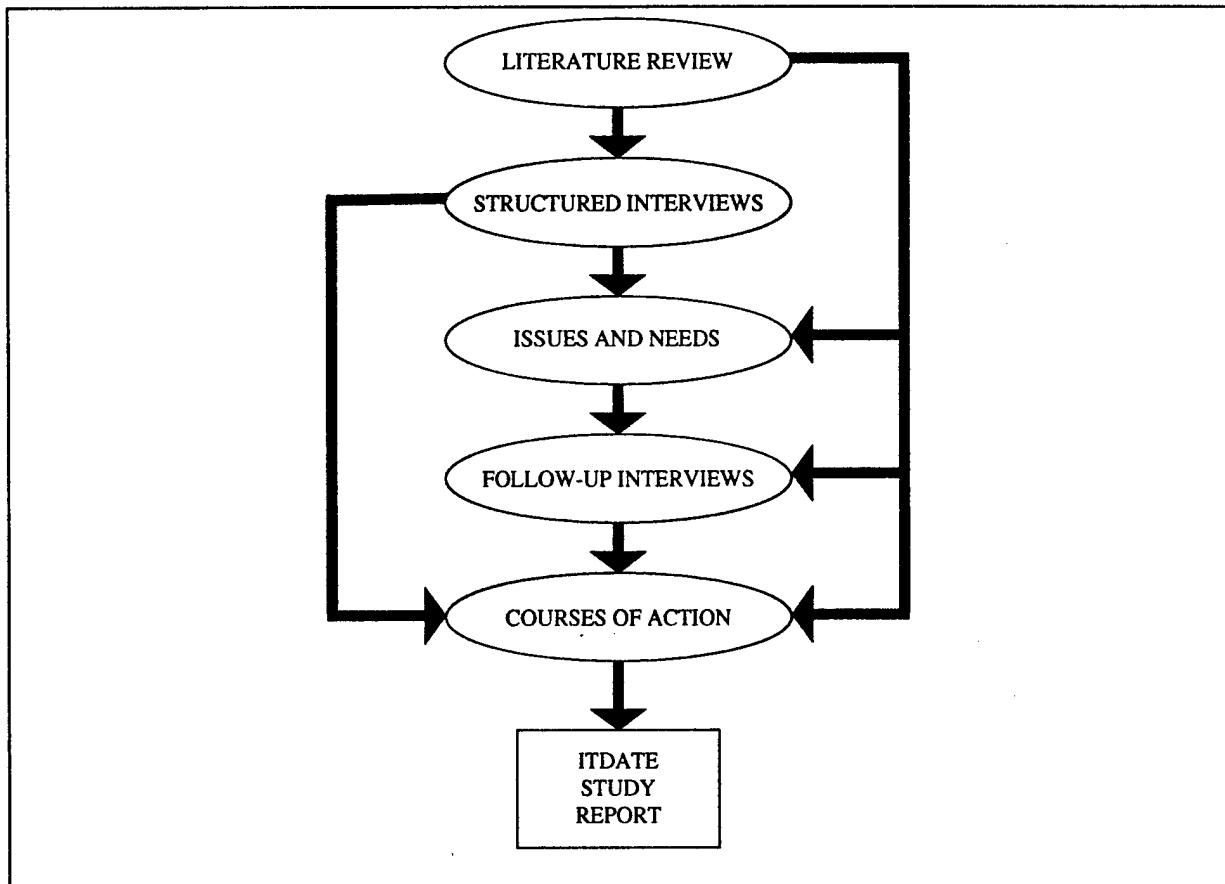


Figure 3. The method used to conduct the Integration of Training Development Among Schools and Distributed Training Environments study.

The first major study objective required the identification and assessment of the issues and needs associated with distributed training development. This was accomplished primarily through the use of structured interviews with SMEs from a number of different organizations. These organizations included TRADOC DCST (Training Development Analysis Activity and Collective Training Directorate), the ATSC, the Fort Hood Warrior-T Office, contract training developers working on behalf of several of the materiel developers fielding equipment at Fort Hood, and representatives from the Armor Center at Fort Knox. Over a four-week period the

study team interviewed 24 SMEs at various locations. These interviews provided considerable insight into the challenges associated with distributed training development activities (see Appendix C). Once the interviews were completed the study team analyzed the data collected and developed a list of the perceived issues (identified problems) and needs (recommended solutions). This list was presented to the ARI COR, the SAG, members of the Warrior-T Office, and a group of proponent school training developers for input.

The next study objective required the development of COAs to address the identified issues and needs. The study team accomplished this task by developing a preliminary list of COAs in coordination with the ARI COR. The study team then refined, analyzed, and compared these four COAs to determine their strengths and weaknesses. Implementation considerations applicable to the short- and long-term were then developed to ensure the COAs completely satisfied all contingencies associated with distributed training development activities. Throughout this step the team continued to collect further data in the form of new (e.g., selected TRADOC Systems Managers [TSMs]) and follow-up interviews. These findings were again presented to the COR, the SAG, and representatives from the Warrior-T Office.

Throughout the study current literature and publications were reviewed and pertinent information was incorporated. A complete list of literature and publications reviewed is provided at the reference list and Appendix D.

## Results

This section of the study report describes the major findings the study team developed through interviews and the review of related literature. It includes a summary of the issues and needs, and the COAs and implementation considerations for integrating distributed training development activities. It also presents the criteria used to assess the COAs and the results of COA analysis done by the ITDATE team.

### Issues and Needs

Prior to developing COAs, issues and needs associated with distributed training development activities were identified using the previously described methodology. A detailed discussion of these issues and needs is at Appendix B. The issues and needs are summarized as follows:

1. Issue: Distributed training development activities and the five phases of SAT

Need: A requirement exists for a clear definition of which SAT phases should be distributed, to whom they should be distributed, and how this should be done.  
Distribution of all phases of SAT can take advantage of technology-based solutions.

2. Issue: Varying approaches to training development

Need: Meeting needs for effective Army training products requires adherence to a development process, like SAT, that is known to be effective and is reasonably standardized. These needs include the fielding of new systems.

3. Issue: Distributed training development tools, agencies, and information flow

Need: A complete management system architecture, which includes hardware, software, policy, and regulatory guidance, is needed to facilitate the interaction among all Army organizations involved in training development. This system should also facilitate the accessing of off-site SMEs during training development activities.

4. Issue: Distributed training development activities in support of unit requirements

Need: Units need additional training tools specific to their needs such as the Commanders' Integrated Training Tool ([CITT], see Glossary). Unit leaders also need training in appropriate portions of the SAT process.

5. Issue: Future requirements for distributed training development activities

Need: A flexible and responsive training development capability should be available to support short-term surge requirements and possibly training development backlogs.

### Courses of Action

Four COAs were derived from the analysis of the interview data, literature, and issues and needs. These issues and needs are complex and overlapping. As a result, the COAs identified below are also complex and certain implementation considerations are common among them. This commonality includes such interview-identified requirements as updating regulatory guidance and updating tools used to support distributed training development activities. However, the basic elements of the COAs are quite different in terms of how they address the fundamental requirements associated with these activities. These fundamental requirements include resourcing and use of existing training development infrastructure. The COAs were also developed with the understanding that it is unlikely that the Army will implement any of these COAs exactly as written. More likely, the Army's approach to addressing the challenges identified in this study will include some aspects of all the COAs. The COAs considered at any given time and the features selected will probably be situation-dependant and tailored to meet requirements as they become apparent.

#### COA 1 Maintain the Status Quo

*Description*: Take no major actions to address the issues and needs associated with distributed training development activities. This COA conserves resources by accepting the current situation as it relates to distributed training development activities. As the Warrior-T Office continues its mission for the next two to three years, plans are made for returning all

training development activities performed by that office to the proponents. Plans for the redistribution of personnel and other Warrior-T Office assets are also to be developed during this time.

*Discussion:* The tools and references required to support distributed training development activities are available, but some gaps in compliance with the regulation-mandated processes and procedures exist. Strengths of the existing system identified in ITDATE study interviews include tools such as ASAT, certain commercial training development software, and references such as TRADOC Regulation 350-70 (DA, 1999c). These tools and references may or may not be adequate to support distributed training development activities, but as indicated in interviews, the lack of universally applied training development standards suggests that an over-arching management system is needed.

The PMs and Program Executive Officers (PEOs) develop training as part of their mission of fielding new equipment and systems. However, the results of ITDATE study interviews indicate that some of the training developed by PMs and PEOs does not conform to TRADOC standards. The AR 350-1, Training and Education: Army Training and Education (DA, 1983), a logical forum to address this type of cross-command coordination, is almost 19 years old. A recent draft update of this regulation (DA, 1999e) does discuss new equipment training (NET) and associated responsibilities, but it does not identify detailed training development responsibilities associated with the new equipment. This draft regulation does say that NET managers must "develop new equipment training products in accordance with the Army's Systems Approach to Training and Army training products standards" (p. 295). If this statement is intended to mandate PM use of the SAT process, applying it to training development work done by contractors for PMs may be difficult since this guidance appears to be in contradiction of Department of Defense acquisition policy (U.S. Army Materiel Command [AMC], 1997) that discourages the use of contracts requiring processes and standard management approaches.

Some interview data indicated that at the end of the Warrior-T Office's two to three year life span, TRADOC proponents would be in a position to conduct training development activities to support new equipment fielding and other requirements. Tools such as ASAT and SATS, perhaps with some future upgrades, were suggested as means to facilitate and expedite training development.

*Long-term considerations:* Long-term implementation of this COA is unlikely since the status quo has not been maintained even during the relatively brief duration of this study. Changes include the consideration of the brigade set fielding (BSF) concept (which will be discussed in greater detail as part of COA 4), revised regulations, and DA reconsideration of Strike Force missions and stationing. However, for the purposes of this report it is useful to consider the long-term implications of this COA. It is reasonable to believe that those tools such as ASAT and certain commercial training development software, and references, such as TRADOC Regulation 350-70 (DA, 1999c), will most likely be further refined during the long-term. These refinements, along with possible upgrades to the computer hardware and software, would no doubt facilitate distributed training development activities. One of the major limitations of maintaining the status quo, however, is the current limited resource level. A major

problem associated with distributed training development, the existing training development backlogs, would therefore probably continue to grow.

### COA 2 Additional Warrior-T Offices

*Description:* Establish Warrior-T Offices at key locations to conduct distributed training development activities in support of proponents. As part of the establishment of these new Warrior-T Offices, regulations and other guidance defining their relationship to proponents, PMs, and other agencies with distributed training development interests, would be created and published.

*Discussion:* During several interviews it was noted that the establishment of the Warrior-T Office at Fort Hood was intended to “jump start” training development associated with the first digital division there. Most of the work done by the Warrior-T Office to this point is part of the analysis phase of SAT. However, this office could perform all phases of the training development process if that was desired by the proponent schools and appropriately coordinated. This capability to support units, PMs, and proponent schools makes the concept of Warrior-T Offices at other locations quite attractive. Locations mentioned as potential sites for similar training development cells included Fort Drum, New York; Fort Polk, Louisiana, and implicitly, Europe. Costs associated with this COA would include increased personnel to staff additional Warrior-T Offices and possibly new facility requirements at some installations.

*Long-term considerations:* As previously noted, the Warrior-T Office was intended to jump-start training associated with the first digital division at Fort Hood. Presumably the Warrior-T Offices established at other locations would have a similar mission with a similar duration. This mission was viewed as being two to three years in duration. However, most of those interviewed indicated that they could envision missions that would be appropriate for this type of organization after the two to three year time frame. These future missions might include NET and support for contingency operations—missions identical to those discussed later in this report for the COA 3 mobile surge team.

### COA 3 Mobile Surge Team

*Description:* Establish a mobile organization, headquartered at an appropriate location, with the mission to perform rapid “surge” training development missions at varied locations in support of proponents and unit requirements.

*Discussion:* This COA envisions a mix of military, civilian, and contractors, similar to the existing Warrior-T Office, which would expand to address other training development requirements. The team’s personnel would include seasoned training developers with SAT experience. Representatives from proponent schools must also be part of this team. This team would be equipped with portable computers, laptops or notebooks, and other items that would facilitate training development in remote locations. Expansion would be accomplished by augmenting the team with temporary-hire civilian contractors who are qualified training developers.

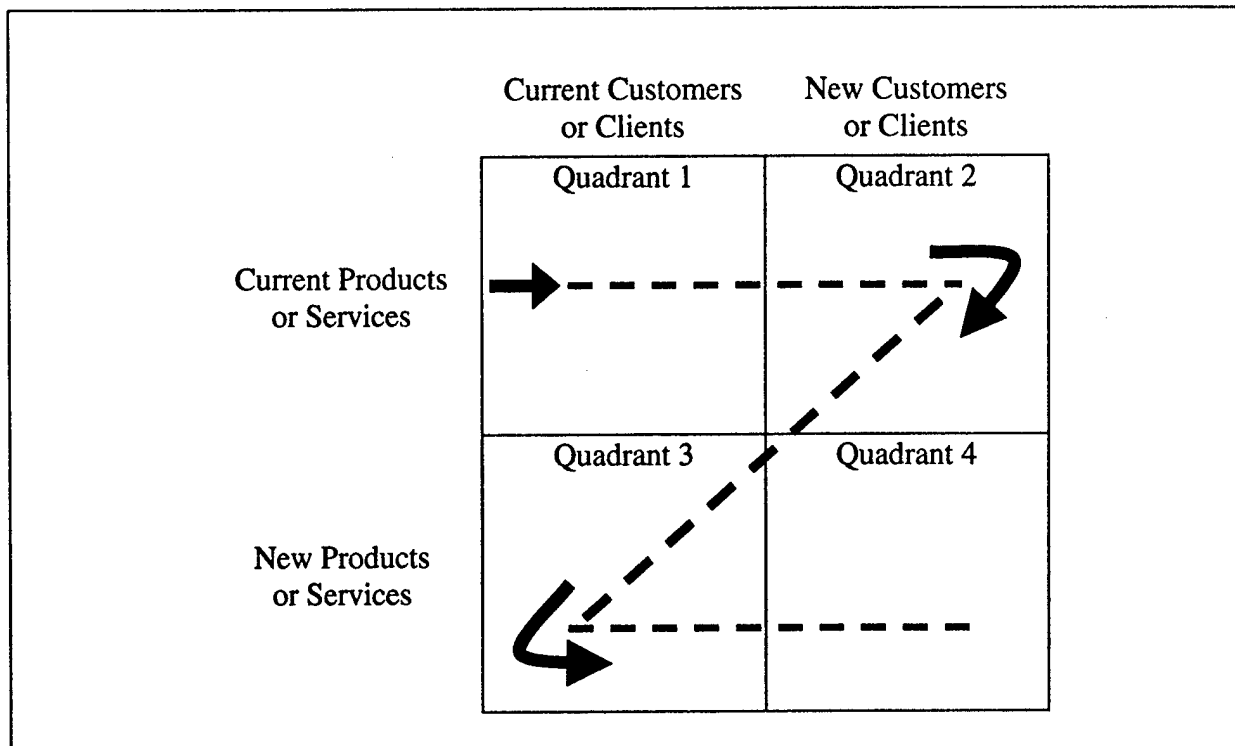


Figure 4. The “Z” Model for business expansion, one technique that could be used to identify risks associated with “mission creep.”

#### COA 4 Unit Set Fielding

*Description:* Perform required distributed training development activities in conjunction with the integrated fielding of new equipment and systems. This COA is based on the concept of fielding to units equipment, doctrine, and required NET as a complete package. It also assumes that a robust training development capability is part of a unit-based systems fielding effort. The fielding effort’s training development capability would include the ability to perform parts of all five phases of the SAT process, in coordination with appropriate proponents. The training development requirements associated with this COA would also include providing input to doctrine writers at proponent schools, and developing supporting TSPs. This COA may also assist in reducing the existing training development backlogs by developing new training materials as new systems are fielded.

*Discussion:* During one ITDATE interview, the 21st Cavalry Brigade (Air Combat) was identified as an organization currently conducting new equipment fielding and training in unit sets. This is a Forces Command unit with a TRADOC-type training and training development mission related to new equipment fielding. Aviation battalions and squadrons are rotated through this organization to conduct Apache Longbow fielding in unit sets along with the associated training. In addition to conducting new equipment fielding, this organization also conducts training development using all phases of SAT. On occasion this organization coordinates with the Aviation School for the approval of new tasks it identifies as part of its

training development work. During another interview, a similar method of fielding equipment and developing NET was recommended as appropriate for armor and mechanized units. This recommended method is similar to the 21st Cavalry Brigade (Air Combat) approach in that it involved bringing units to Fort Hood to receive new equipment and the associated training. A similar strategy has recently been proposed by the Army in the form of BSF. The June 1999 Brigade Set Fielding Information Briefing by the Deputy Chief of Staff for Operations and Plans (DA, 1999a) suggests that training development may be a consideration in fielding brigade sets. Unlike the 21st Cavalry Brigade (Air Combat) approach, BSF may move to some unit locations for equipment fielding, as opposed to bringing all units to the same installation. In support of unit, organization, and installation requirements during BSF, the briefing recommended the development of comprehensive TSPs. A concept similar to BSF, Total Package Fielding, is described in Army Development, Acquisition and Fielding Strategy (DA, 1999b). Resource requirements associated with this option are increased personnel, some facilities, and possibly extensive travel and transportation costs.

*Long-term considerations:* Unit set fielding, if it follows the schedule for BSF, would occur primarily as a long-term action. Although the short-term would see BSF with some organizations, the bulk of this effort would occur during the long-term of three to seven years. Should BSF proceed as described in the June, 1999 information briefing (DA, 1999a), not all new systems will be fielded as part of this effort. These units would experience additional new equipment fielding after BSF. This suggests some aspects of new equipment fielding would remain incremental, as it is today, and further requirements would exist for training development support for these units after they have completed BSF.

#### Course of Action Analysis

In assessing the COAs identified above, the ITDATE team identified criteria that seemed appropriate for evaluating the feasibility of each COA. The criteria were largely derived from data collected during the interviews, the original Statement of Work ([SOW]) ARI, 1998), and requirements identified in references, such as TRADOC Regulation 350-70 (DA, 1999c). The specific criteria are:

- **Cost:** Implementation cost must be reasonable. Sources such as this study's SOW and the TRADOC status report previously cited, clearly indicate that this is an age of diminishing resources. Although a detailed cost/benefit analysis is outside the scope of the ITDATE study, by making assumptions the team can draw some conclusions about the relative costs of the COAs.
- **Completeness:** ITDATE study interviews showed that there are a variety of issues and needs associated with distributed training development activities. The results of the interviews also indicate that many of these issues are interrelated. The four COAs are designed to address each of the needs. However, the COAs are not equally effective in terms of how completely they address the needs.
- **Integration potential:** Compatibility with the existing training development infrastructure is desirable. This infrastructure includes the capability to manage training



development activities by using existing organizations and policy. Important tools and references required for distributed training development activities were identified during interviews as being TRADOC Regulation 350-70 (DA, 1999c), several types of commercial off-the-shelf software, and ASAT. Although the interviews also found a need for a complete management system architecture, which includes hardware, software, policy, and regulatory guidance, short-term requirements for training development can be satisfied with the existing tools and references.

- **Flexibility:** Responsiveness to the rapid fielding of new systems and unit needs is essential during both the short-term and the long-term. The BSF concept briefing (DA, 1999a) indicates that in some divisions some equipment will be fielded after the BSF effort is completed. Late fielding of some equipment suggests that in order to be viable, a COA must be responsive to the rapidity, as well as discontinuities and delays, in fielding new systems.

### Analysis Results

The assessment of the four COAs is not intended to result in the recommendation of a preferred COA. As noted previously, the expectation is that the Army will consider all of the COAs, and implement portions of all or some of them, depending on the variables of the situation under consideration. The analysis below is presented to assist in identifying the strengths and weaknesses of the components of each COA. In assessing the COAs against the criteria, the ITDATE team's major goal was to be as objective as possible. However, the qualitative nature of this study does not lend itself to complete quantification. Using a simple assessment system of pluses, minuses, and zeros, which represent neutral value, the team was able to evaluate the COAs in the most objective manner possible. Analysis of each COA against the identified needs, which are also the completeness criteria, is at Table 1. The Table 2 data are based on the four criteria, above. Both tables are presented after the analysis descriptions.

#### COA 1 Maintain the Status Quo

**Cost.** This COA's most obvious strength is that it requires no additional resources, if the Army is willing to accept the existing training development backlogs. It can be argued that doing nothing creates greater future costs at some point to eliminate the backlogs, or the Army must be prepared to accept the cost of inadequately trained soldiers and unit. However, this COA assumes that TRADOC and the Army are willing to accept these backlogs and any associated training inadequacies.

**Completeness.** This COA can be expanded with new policy and guidance to satisfy the first and second needs. Although policy and guidance are a part of the third need, the critical software and hardware aspects of the third need are not addressed. This COA does not address the fourth and fifth needs.

**Integration potential.** This COA's neutral assessment in the criterion of integration is based on the existing ambiguous state of the training development infrastructure. Tools such as TRADOC Regulation 350-70 (DA, 1999c), various commercial off-the-shelf software, and

ASAT are currently being used to facilitate training development activities, whether distributed or not. On the other hand, the unit tool SATS is not being used to its full potential and there are gaps in the existing policy guidance as it relates to training development responsibilities.

Flexibility. The existing training development backlogs suggest that this COA lacks the flexibility required to keep pace with the rapid fielding of new systems and other emerging doctrine. Although the establishment of the Warrior-T Office shows that the current situation includes at least partial solutions, personnel decrements and training development backlogs identified in the TRADOC status report (DA, 1999d) indicate that the existing status quo lacks the flexibility to keep pace with rapid fielding of new systems.

#### COA 2 Additional Warrior-T Offices

Cost. This COA will require increased costs in the form of additional personnel and facilities, and thus cost is assessed as a negative factor.

Completeness. The COA can also be easily expanded to include the policy guidance suggested by the first need, the second need, and part of the third need. Since the COA involves stationing Warrior-T Offices at several locations, presumably making training development support more accessible to units, it partially satisfies the fourth need. It also satisfies the short-term surge aspect of the fifth need.

Integration potential. The COA received a positive rating based on the way the existing Warrior-T Office is able to use and apply the existing tools and references associated with distributed training development activities. The assumption is that if one office can apply these tools, then it would seem to follow that several others would also be able to effectively apply them.

Flexibility. The COA is assessed as neutral in terms of its effectiveness supporting the rapid fielding of new systems. The Warrior-T Office at Fort Hood, which is the model for the additional offices, is supporting the fielding of new systems and it has clear potential to provide further effective support. However, it is not clear that geographically dispersed offices would be effective in supporting Army-wide rapid fielding of new systems with training development. Specifically, it might be difficult for the proponent schools to exercise their training development responsibilities when dealing with several different Warrior-T Offices.

#### COA 3 Mobile Surge Team

Cost. This COA is also assessed as negative in this area since it will require some increased costs in the form of additional personnel and facilities. Although these costs are not as extensive as those in COA 2, this COA clearly requires additional resources.

Completeness. COA 3's completeness is similar to that of COA 2. It can also be adapted with new policy and guidance to satisfy the first need, the second and part of the third. Because the COA has the capability to expand and surge to meet varied requirements, it partially satisfies the fourth need and all of the fifth need.

Integration potential. The COA received a positive rating based on its tools, such as ASAT access, and a command and control structure, which would place it under the control of the appropriate proponents during some training development work.

Flexibility. The capability to expand, surge, or contract as needed, suggests that this COA would be quite effective in supporting the rapid fielding of new systems.

#### COA 4 Unit Set Fielding

Cost. Costs associated with this COA have clear potential to be quite high. Transportation of equipment and travel costs associated with personnel could be significant depending on how this COA is implemented. Equipment transportation would be excessive if this required all units to come to one installation to receive their new systems, like the 21st Cavalry Brigade (Air Combat). Conducting unit set fielding at the home stations of the units receiving the new systems would result in high personnel travel costs.

Completeness. This COA is almost evenly split between plusses and minuses in this criterion. It can be expanded to satisfy the first need, the second need, and some portions of the third and fourth needs. It cannot be determined whether or not this COA can support the unit aspects of the fourth need. This COA does not address the fifth need.

Integration potential. This COA's positive assessment on the criterion of integration is based on an assumption that the training development capability associated with this COA would be able to effectively use the existing training development infrastructure.

Flexibility. Since some of the existing training development backlogs are attributed to the fielding of new systems, integrating training development with new systems fielding appears to give this COA an advantage in the area of flexibility.

#### Discussion of Implementation Considerations

In implementing a COA, or portions of multiple COAs, there are several important considerations, or guidelines, that must be addressed in order to ensure complete resolution of issues and needs related to distributed training development activities. These guidelines are addressed below as short-term and long-term implementation considerations, and they are intended to complement the analyses.

Short-term implementation considerations consist of fairly straightforward actions which can be accomplished over the next two to three years. The two long-term considerations will require more time to implement, perhaps three to seven years, and they will involve the significant commitment of new resources; therefore in all cases, it is recommended that implementation be preceded by further study to identify all possible costs and benefits.

Table 1  
Course of Action and Needs Comparison

	COA 1 Maintain the status quo	COA 2 Additional Warrior-T Offices	COA 3 Mobile surge team	COA 4 Unit set fielding
Need 1				
Defines phase to distribute	+	+	+	+
Established responsibilities	+	+	+	+
Need 2				
Applies Systems Approach to Training (SAT)	+	+	+	+
Need 3				
Hardware/software requirements	-	-	-	-
Overarching policy	+	+	+	+
Need 4				
Unit requirements	-	+	+	0
Leader training in SAT	-	-	-	-
Need 5				
Short-term surge	-	+	+	-
Backlogs	-	-	+	-
<b>Total</b>	-	+++	+++++	0

*Note:* In this assessment ( + ) represents a positive value, ( - ) represents a negative value, and ( 0 ) represents a neutral value.

Table 2  
Course of Action Analysis

Criteria	COA 1 Maintain the status quo	COA 2 Additional Warrior-T Offices	COA 3 Mobile surge team	COA 4 Unit set fielding
Cost	+	-	-	-
Completeness	-	+	+	0
Integration potential	0	+	+	+
Flexibility	-	0	+	+
<b>Total</b>	-	+	++	+

*Note:* In this assessment ( + ) represents a positive value, ( - ) represents a negative value, and ( 0 ) represents a neutral value.

## Short-Term Implementation Considerations

### Culture

Several persons interviewed emphasized the importance of culture in dealing with the challenges of distributed training development. Implementation of COA 2, COA 3, and possibly COA 4 requires that careful consideration be given to organizational culture, particularly in the context of command and control. Goodstein et al. (1993) describe organizational culture as "the way we do things around here," and the values, beliefs, and assumptions common in an organization. They also describe instances where cultural mismatches within an organization have resulted in problems with mission accomplishment.

Establishing Warrior-T Offices at various installations, COA 2, may present the risk of the new Warrior-T Office assuming the local culture. While this could serve to enhance the offices' unit (customer) focus, it could work against the training policy and regulatory interest of TRADOC DCST. As a matter of necessity, the COA 3 mobile surge team will be "sub-contracted" to units and agencies with training development requirements. This suggests that the parent organization of the mobile surge team must be flexible and customer-oriented. The ATSC, with its focus on providing services and products to various Army customers, is a choice to be the higher headquarters. Important issues related to regulatory guidance and other policy would come from TRADOC DCST, the higher headquarters of ATSC. Implementation of COA 4 may tie the training development associated with new equipment fielding to organizations that tend to operate as process cultures. A process-focused organization is good in terms of its adherence to important policy and regulations, but it may not be responsive to unit (customer) training development needs.

### References

Distributed training development activities impact organizations other than TRADOC. Army-wide standards are needed to ensure quality training development throughout the force. Specifically, AR 350-1 (DA, 1999e) must be revised to clearly define PM-TSM and other coordination responsibilities. The complexity of these relationships suggests clear language and diagrams reflecting responsibilities and actions would be most helpful. That regulation should also require the use of SAT during the development of new equipment and systems. Additionally, TRADOC Regulation 350-70 (DA, 1999c) and AR 350-1 should define the SAT phases which are appropriate for distributing, and assign responsibilities for training development distribution.

### Unit requirements

Although there is no indication TOE units need to perform complete training development activities in the manner of proponents, there are some indications that SAT has some applicability to units. Noncommissioned officers (NCO) and officers might receive training in SAT at schools such as Advanced Noncommissioned Officer's Course and the Captain's Career Course (formerly known as the Advanced Course), or this training could be done on a distributed basis via the Internet. TRADOC should also identify what phases of SAT are applicable to TOE

units and how they should be applied. Automated tools for unit use appear to be a "mixed bag." The developmental CITT shows promise in terms of facilitating the ability of units to easily tailor training to meet their objectives. CITT, a developmental project, is intended to allow unit trainers to access and tailor via the Internet TSPs to support training with the Close Combat Tactical Trainer virtual simulation (Gossman et al., 1999). SATS is another on-line tool intended for units, but at this time, units appear reluctant to use it as a training management tool.

### Tools

TRADOC should continue to develop and refine tools to facilitate distributed training development activities. The goal of further development and refinements should be two-fold: First, the propagation and promulgation of doctrine throughout the Army, particularly collective and individual tasks; second, the facilitation of the development of tailorable TSPs which meet the needs of a variety of users.

Tools such as ASAT and the General Dennis J. Reimer Training and Doctrine Digital Library are perceived as being effective, but somewhat cumbersome. As previously mentioned, units seem reluctant to use SATS, or they use it only as a scheduling system. Continued software and hardware improvements will no doubt further enhance the value of these tools. The CITT is an example of such a tool.

### TRADOC Systems Manager Training

TRADOC should initiate a training development effort intended to result in an appropriate training course for TSMs. The broad scope and complexity of TSM duties suggest that this would be an extensive training development effort. Given the importance of TSMs in the fielding of new systems, it could be argued that their training merits consideration equal to that of attendees at the Pre-Command Course. Some portions of such a course might also be appropriate for PEO and PM attendance. The results of some interviews indicated that many of the problems associated with new systems could be attributed to the lack of interface between PMs and TSMs. Other interview data indicated that TSMs receive no training in preparation for their important and complex duties. Other key TRADOC staff officers might also benefit from this training.

### Long-Term Implementation Considerations

#### Directorate of Evaluation and Standardization Restoration

TRADOC should restore a robust and independent Directorate of Evaluation and Standardization (DOES) in the proponent schools. Although DOES restoration has great potential for increased costs, anecdotal evidence gathered by this study suggests that the benefits may outweigh these costs. During several interviews the absence of this function in the proponent schools was cited as a potential threat to distributed training development activities. Specifically, the absence of an effective DOES in the proponent schools could limit their ability to conduct the evaluation phase of SAT during distributed training development activities. Although the latest version of TRADOC Regulation 350-70 (DA, 1999c) refers to proponent

schools DOES in Part III, this is qualified with the phrase "or functionally equivalent organization which implements these measures for the proponent school commandant" (p. III-0-1). Some schools have restored a DOES office to their organization, but most of these do not appear to be resourced as fully as the agencies of some years ago.

#### Products of the Systems Approach to Training Process

TRADOC should conduct a detailed review of SAT to determine, in as specific terms as possible, the desired products and outcomes of this process. Examples of products and outcomes might include desired training techniques, requirements for job aids, and identification of proper training site. Although TRADOC regulation (DA, 1999c) addresses these outcomes in a general manner, specific considerations relative to the type of training may be essential in the future. Insight gained from this review should then be used to define training development standards applied to training development contracts. Although some interviews suggested that SAT was very cumbersome, most indications suggest that it is an important and viable process for developing quality training. Some interviews indicated that the contractors not being required to use SAT when developing training for new systems resulted in a substandard product. However, Department of Defense level acquisition guidance (AMC, 1997), which has been distributed throughout the AMC, indicates that contractual requirements for processes and standard management approaches should be avoided. This policy suggests that although some PMs now require the use of this process for training development, in the future PMs may not be able to require contractor adherence to SAT.

#### Conclusions

When applying the results of this study, proposed actions will need to be evaluated in terms of the conditions that exist at the time of implementation decisions. This study did not recommend implementation of any specific COA. In that context, the findings of this study should be viewed as a guide. However, decision-makers must also recognize that study analysis suggests clear differences in COA effectiveness. The analysis results indicated that COA 3, the mobile surge team, is the most effective COA.

While the other COAs do not appear to be as capable as the mobile surge team described in COA 3, all except the apparently inadequate first COA, may be appropriate in certain situations. The effectiveness of the first COA, maintaining the status quo, is minimal when it is assessed against the study-identified needs and the criteria used to analyze the COAs. It completely satisfies only two of five needs, partially satisfies one, and it was assessed as positive in only one of the four assessment criteria—cost. Additional Warrior-T Offices, COA 2, appears to lack the capability to address the training development backlogs, and its ability to support the rapid fielding of new systems, a critical future concern, could not be assessed during study COA analysis. However, COA 2 may be an effective way to focus training development in support of an important effort. In addition to the strengths described elsewhere in this study, COA 3 implementation may provide a means for DCST to address its other short-term needs. Although the needs comparison results of COA 4, unit set fielding, suggest it is only slightly more effective than COA 1 in satisfying study-identified needs, its application might result in a fully integrated and highly effective NET effort.

The application of these study findings by TRADOC, in coordination with other affected agencies, will provide a framework to guide decisions. Decision makers and planners at TRADOC should find that when the study results presented here are tempered to reflect local conditions and emerging requirements, they provide a useful tool for identifying requirements and actions to enhance distributed training development activities. Implementation of any COA, or combination of COAs, is likely to require further study and analysis. For example, establishment of a mobile surge team will require more detailed staffing and cost analysis than that accomplished by this study. Further study of specific technologies which can support specific aspects of distributed training development activities is also needed. One example is the use of technology to conduct task analysis with training developers and SMEs at different locations.



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Appendix A  
Acronym List and Glossary

Acronyms

ABCS	Army Battle Command System
AFATDS	Advanced Field Artillery Tactical Data System
AFRU	Armored Forces Research Unit
AIMS-R	Automated Instructional Management System-Redesign
AMC	U.S. Army Materiel Command
AMT	Army modernization training
AR	Army Regulation
ARI	U.S. Army Research Institute for the Behavioral and Social Sciences
ASAS	All Source Analysis System
ASAT	Automated Systems Approach to Training
ATIMP	Army Training Information Management Program
ATSC	Army Training Support Center
BSF	brigade set fielding
CATS	Combined Arms Training Strategies
CG	commanding general
CITT	Commanders' Integrated Training Tool
COA	course of action
COR	contracting officer's representative
COTR	contracting officer's technical representative
CTC	Combat Training Center
CTSF	Central Technical Support Facility
DA	Department of the Army
DCST	Deputy Chief of Staff for Training
DOES	Directorate of Evaluation and Standardization
DTDD	Directorate of Training and Doctrine Development
FBCB2	Force XXI Battle Command Brigade and Below
FM	field manual
FORSCOM	Forces Command
G3	division operations officer
HumRRO	Human Resources Research Organization
ID	infantry division
ITDATE	Integration of Training Development Among Schools and Distributed Training Environments

LTC	lieutenant colonel
MCS	Maneuver Control System
NATO	North Atlantic Treaty Organization
NCO	noncommissioned officer
NET	New Equipment Training
NSTO	New Systems Training Office
PEO	program executive officer
PEOC3S	Program Executive Office Command, Control, and Communications Systems
PM	project or program manager
SAG	Study Advisory Group
SAT	Systems Approach to Training
SATS	Standard Army Training System
SME	subject matter expert
SOW	statement of work
TASS	Total Army School System
TOE	Table of Organization and Equipment
TPIO	TRADOC Program Integration Office
TRADOC	U.S. Army Training and Doctrine Command
TSM	TRADOC Systems Manager
TSP	training support package

## Glossary

Army Training Information Management Program (ATIMP). The ATIMP integrates over 25 Army training information systems that support institutional training, unit training, and training support. The ATIMP provides:

- A management support infrastructure to enhance the coordination of system, process, and data integration and to preclude the development of unnecessary or redundant training business processes, business rules, and information systems.
- A coordinated system of change management to ensure all related functional user requirements are considered prior to effecting changes.

Automated Systems Approach to Training (ASAT). Army-wide system for automated training and doctrine development; the proponent-based tool for developing and producing training and doctrine information and products. The ASAT supports both Warrior XXI and Warfighter XXI through its total Army task-based training and doctrine database. This database provides the foundation for both the Automated Instructional Management System-Redesign (AIMS-R) for institutional training and the Standard Army Training System (SATS) for unit training.

Combat Training Center (CTC) Program. An Army program established to provide realistic joint service and combined arms training in accordance with Army doctrine. It is designed to provide training units opportunities to increase collective proficiency on the most realistic battlefield available during peacetime. The four components of the CTC Program are:

- The National Training Center
- The Combat Maneuver Training Center
- The Joint Readiness Training Center
- The Battle Command Training Program

Combined Arms Training Strategy (CATS). The Army's overarching strategy for the current and future training of the force. This strategy: describes how the Army will train the total force to standard, consists of unit, individual, and self-development training strategies; identifies, quantifies, and justifies the training resources required to execute the training.

Commanders' Integrated Training Tool (CITT). The CITT is a fully integrated training and training management system that supports all features of unit training in the Close Combat Tactical Trainer. It includes exercise selection and development, extensive supporting information and help, navigation aids, and exercise management functions for a variety of users.

Distance Learning. The application of multiple means and technology to deliver standardized training (individual, collective, self-development) to soldiers and units at the right place and right time.

**Distributed Training Development Activity.** A process, or activity, in which selected phases of the Systems Approach to Training (SAT) process, or actions in support of the SAT process, are performed at more than one location with the guidance and oversight of appropriate proponents. Information and products associated with this process can be exchanged using electronic technology (e.g., the Internet) and other means.

**General Dennis J. Reimer Training and Doctrine Digital Library.** An on-line reference system that allows trainers, trainees, training developers, and doctrine writers to store and retrieve training products and materials via the Internet and personal computers. Its features include an electronic card catalog or pointer (transparent to the users) to doctrinal and training information and products stored in various databases/repositories.

**Project or Program Manager (PM).** Individual who provides centralized, intensive project and program management; serves as central acquisition management authority for directing and controlling a specific materiel item or system.

**Proponent Agency.** An Army organization or staff that has been assigned primary responsibility for materiel or subject matter experts in its area of interest.

**Proponent School.** The TRADOC school designated by the Commanding General (CG), TRADOC, or appropriate Major Army Command as training proponent to exercise supervisory management of all combat/training development aspects of a materiel system, functional area, or task. It analyzes, designs, and develops training/training products for proponent area.

**Systems Approach to Training (SAT).** A logical process for effectively and efficiently determining what, where, when, and how tasks should be taught. It consists of five interrelated phases of analysis, design, development, implementation, and evaluation.

**TRADOC Program Integration Office (TPIO).** Office that serves as the Army's centralized manager and integrator of a specific system to ensure horizontal and vertical information flow across the battlespace at each echelon. Additionally, it defines and/or integrates all requirements and responsibilities from the theater Army to the individual soldier or platform.

**TRADOC System Manager (TSM).** An individual appointed by the CG, TRADOC, responsible for coordinating the combat/force developer, user, and trainer efforts in the life cycle management of the assigned system. This individual also is responsible for doctrinal and organizational standardization and interoperability with North Atlantic Treaty Organization (NATO).

**Training Developer.** The individual whose function is to analyze, design, develop, and evaluate training and training products, to include development of training strategies, plans, and products to support resident, non-resident, and unit training. Any individual functioning in this capacity is a training developer regardless of job or position title. In developing systems, the command or agency responsible for the development and conduct of training which will provide the tasks necessary to operate and logistically support the new materiel system.

**Training Development.** The Army's training development process is a systematic approach to making collective, individual, and self-development training decisions for the total Army. It determines whether or not training is needed; what is trained; who gets the training; how and where the training is presented; and the training support/resources required to produce, distribute, implement, and evaluate those products. The process involves five training related phases: analysis, design, development, implementation, and evaluation. (Note: Do not confuse the overall training development process with the particular SAT phase called "development," which is related specifically to the development of training and training products following analysis and design.)

**Training Development Management.** The process proponents use to plan training development, determine and allocate training development resources, schedule training development, and ensure quality training products are produced.

**Training Support Package (TSP).** A complete exportable package integrating training products, materials, and/or information necessary to train one or more critical tasks. Its contents will vary depending on the training site and user.

**Warfighter TSP.** A task-based information package that provides a structured situational training scenario for live, virtual, or constructive training and assists the commander in conducting and assessing unit training.

**Warfighter XXI.** Warfighter XXI focuses on unit training. It provides the concept for total Army training in the 21st century. It is integrated in all future developments and initiatives to produce a coherent training system for the power projection Army of today and tomorrow.

**WarMod TSP.** A package of training products/materials used to initially train individual operator/maintainer/repairer, battle staff, or collective tasks for new equipment/systems. It provides the means to deliver training anywhere in the world, to include in the institution, at the unit, or at the contractor facility. Training may be conducted via formal instruction or distance learning in a live, virtual, or constructive environment. It will be used for Instructor and Key Personnel Training and may include doctrine, tactics, techniques, and procedures training.

**WarMod XXI.** The Army modernization training (AMT) effort which provides training and training products to support the fielding of new equipment. As the training piece of equipping the force, WarMod XXI supports Warfighter XXI and Warrior XXI.

**Warrior-T Office.** A Fort Hood, Texas-based TRADOC Deputy Chief of Staff for Training (DCST) office with the mission to ensure AMT supports the objectives of Force XXI. The Warrior-T Office does this by leveraging Program Executive Office Command, Control, and Communications Systems, PM, and 4th Infantry Division/III Corps experience and knowledge. The office assists PMs and proponents in incorporating digital lessons learned; in improving interaction among training, combat, and materiel developers; and in delivering quality, standardized, timely doctrine and training to soldiers.

Warrior TSP. A package of training products/materials necessary to train one or more critical individual tasks anywhere in the world, to include in the institution, at the unit, or in a soldier's home. Training may be conducted using formal instruction, self-study, or distance learning in a live, virtual, or constructive environment.

Warrior XXI. Warrior XXI defines the future training activities in the Table of Distribution and Allowances Army. It provides a future architecture for the development of training products and policies. The eight major initiatives that comprise the Warrior XXI vision are Total Army School System (TASS), Clusters and Satellites, Classroom XXI, Distance Learning, Automation/Digitalization, Training Development Revitalization, Diagnostics, and Advanced Training Strategies.



## Appendix B

### Issues and Needs

The environment of this study, as it relates to the U.S. Army Training and Doctrine Command (TRADOC), could appropriately be described as one of diminishing resources and increasing requirements. The TRADOC status report for the third and fourth quarters of Fiscal Year 1998 (Department of the Army [DA], 1999d) shows that training developer and doctrine developer authorizations in TRADOC decreased from 2,789 in 1988 to 978 in 1998. During the same period combat developer strength decreased from 2,396 to 963. Concurrent with these personnel decrements, training development requirements have increased as a result of the Army's military occupational specialty consolidation efforts and new equipment fielding. Examples include the Army Battle Command System (ABCS) including Maneuver Control System (MCS), All Source Analysis System (ASAS), and Force XXI Battle Command Brigade and Below (FBCB2). Not surprisingly, the TRADOC status report cited previously rated training development as C4, the lowest rating.

In addition to training developer decrements, the Integration of Training Development Among Schools and Distributed Training Environments (ITDATE) study interviews suggest that TRADOC's ability to conduct training development is further negatively impacted by the elimination of the Directorate of Evaluation and Standardization (DOES) function in proponent schools. Some interviewees held the opinion that distribution of training development activities had the potential to reduce the existing training development backlog. Personnel interviewed by the ITDATE team were in near unanimous agreement that distributed training development activities are common throughout TRADOC. The study also found cases of distributed training development activities happening in Army organizations other than TRADOC. This was usually described as being beneficial since it facilitates training developer access to subject matter experts (SMEs) in the field.

#### 1. Issue: Distributed training development activities and the five phases of Systems Approach to Training (SAT)

*Discussion:* Although the interviews conducted suggested near-universal agreement on the existence of distributed training development activities, there is a wide range of opinions on what parts of SAT should be distributed. Although all phases of SAT were mentioned by some respondents as being appropriate for distributed training development, the strongest opinions involved analysis and design. Analysis was identified as the phase that could be most appropriately distributed since the associated technology would facilitate SME and training developer coordination. The application of technology to support distributed analysis activities is likely to become increasingly important as TOE units are staffed at full strength and proponents are not. Several interviews indicated that decisions concerning resources, such as training locations, training methods, and media, do not lend themselves to distribution; therefore design was perceived as being the least appropriate to distribute. Evaluation, implementation, and development were less frequently identified as candidates for distribution. However, implementation is commonly distributed in the form of unit training based on doctrine such as Mission Training Plans and Soldier Training Publications. Some of the interviews emphasized the importance of appropriate SME support in training development. This would suggest that

distributed techniques could be important during the development phase in areas such as validating the training materials and instructor training. As implementation is distributed, evaluation, or the gathering of feedback on the results of training, is by nature distributed. This function is not being accomplished adequately in TRADOC due to the elimination of the DOES.

*Related Questions:*

- What phases of SAT are most appropriate for distribution?
- Are there phases (e.g., design) that should not be distributed?
- If some phases of SAT cannot be distributed now, will emerging technology eventually facilitate the distribution of all phases?

Need: A requirement exists for a clear definition of which SAT phases should be distributed, to whom they should be distributed, and how this should be done. Distribution of all phases of SAT can take advantage of technology-based solutions.

2. Issue: Varying approaches to training development

*Discussion:* The ITDATE study interviews indicate that training development methods and standards are prescribed in TRADOC Regulation 350-70 (DA, 1999c), but the application is not universal. In one case, the study found a Forces Command (FORSCOM) training activity applying the standards of TRADOC Regulation 350-70 to its training development requirements. In another case, the study encountered indications of training development not being done to any particular standard. It is not surprising then that some interviewees expressed concern that without proper policy and management oversight distributed training development activities might not meet appropriate standards.

*Related Questions:*

- How do TRADOC standards/regulations get applied to non-TRADOC organizations?
- What methods are appropriate for accomplishing and managing distributed training development activities?
- How do proponent schools coordinate with Program Managers (PMs) and Program Executive Officers (PEOs)?
- What is the role of the TRADOC Systems Manager (TSM) or TRADOC Program Integration Office (TPIO) in the training development done to support new equipment fielding?

Need: Meeting needs for effective Army training products requires adherence to a development process, like SAT, that is known to be effective and is reasonably standardized. These requirements include the fielding of new systems.

3. Issue: Distributed training development tools, agencies, and information flow

*Discussion:* Many of the personnel interviewed cited TRADOC Regulation 350-70 (DA, 1999c) as a key source of information for training development policy. Important tools required for distributed training development activities were identified as being commercial off-the-shelf software and Automated Systems Approach to Training (ASAT). Although ASAT was often identified as being cumbersome, in two cases the ITDATE team found complex training development being done—in part, distributed—using ASAT. These tools may or may not be adequate or sufficient. What appears to be lacking is an over-all management system.

*Related Questions:*

- How do agencies accomplish distributed training development activities?
- Who, or what offices or agencies, should be involved?
- At what point in the training development process should these offices and agencies be involved?

Need: A complete management system architecture, which includes hardware, software, policy, and regulatory guidance, is needed to facilitate the interaction among all Army organizations involved in training development. This system should also facilitate the accessing of off-site SMEs during training development activities.

4. Issue: Distributed training development activities in support of unit requirements

*Discussion:* Although the ITDATE team found indications of requirements for training development expertise in Table of Organization and Equipment organizations, no formalized means of routinely providing this expertise was identified, except in one case where the team observed a FORSCOM organization with a training mission. In order to be prepared for a variety of contingency operations, units increasingly need to tailor available training support packages. They also need to share and benefit from one another's training experiences and materials. The Commanders' Integrated Training Tool (CITT) for the Close Combat Tactical Trainer provides a prototype for meeting these needs.

*Related Questions:*

- What are the unit training development requirements?
- Which of these requirements, and to what degree, can be met by unit training development activities?
- How can unit officers and NCO leaders be trained in appropriate aspects of SAT?

Need: Units need additional training tools specific to their needs such as the Commanders' Integrated Training Tool (CITT). Unit leaders also need training in appropriate portions of the SAT process.

5. Issue: Future requirements for distributed training development activities

*Discussion:* The Warrior-T Office at Fort Hood, Texas, was intended to be a short-term effort to meet "surge" requirements generated by training development related to digitization. The team found that among the personnel interviewed it was understood that Warrior-T would be in place for only two to three years. However, most of the people interviewed expressed the opinion that there were many viable missions, now and in the future, for a cell such as Warrior-T. Such a cell could address training development backlogs and contingencies related to deployment or the introduction of new equipment.

*Related Questions:*

- How can TRADOC maintain a ready short-term surge training development capability?
- What would the appropriate command and control mechanism be for such an organization?
- Could such a capability assist in reducing TRADOC's training development backlog?
- How can distributed training development activities support emerging contingency requirements?

Need: A flexible and responsive training development capability should be available to support short-term surge requirements and possibly to address training development backlogs.

## Appendix C

### Selected Interview Responses

These responses to the Integration of Training Development Among Schools and Distributed Training Environments (ITDATE) study questions represent a selection of the more insightful and useful comments gathered during the initial phase of study data collection. Respondents included personnel from various U.S. Army Training and Doctrine Command (TRADOC) elements, proponent schools, contractors, and others with distributed training development experience.

1. Are training development activities becoming more distributed throughout the Army?
  - a. Yes, it's not new. Some time ago I used the phrase distance training development.
  - b. Well, they are through Warrior-T and through the subcontractors. I mean, now we have contractors who are working on FBCB2 tasks at the same time that we are, so that's a form of distributed training development. And that is in addition to what they are doing at Warrior-T.
  - c. I think in a broad interpretation of the question, most definitely yes; because even though we've always used contractors for the different phases of the development, the training development, process, I think you find more and more that happening. Now, even though the proponent theoretically controls that contractor and the work, the fact that it is being done outside of the proponentry per se, I would classify as distributed.
2. Is the current level of distributed training development activities appropriate?
  - a. I think it is very appropriate. I don't think the current level is nearly sufficient.
  - b. I think we could increase it. The work done in the Warrior-T cell is essentially distributed.
  - c. Not really. The training development activity level is not appropriate or sufficient. (Distributed training development activities) cannot be good without more training development expertise.
  - d. I think the technology is there to allow more of it to be done. I think more of it could be done by linking directly to units, maybe through their division operations officer (G3) office or whatever, especially on the doctrinal side.
  - e. Our training development is broken. Schools are at 50 percent. We are assuming new systems, and in this case, taking new systems without going through a process that we have really anchored over many years.

3. What specific advantages and disadvantages are associated with distributed training development activities?
  - a. Any change is going to have some resistance to it. But that's not necessarily a disadvantage associated with the activity. It can be any activity. Any change is going to cause that. I think we've got, just to go in order, the specific advantage I see, one of the prime advantages, is that quick information feedback turnaround from a number of sources. Saying that, the disadvantage to that, is the quality of that information.
  - b. I think distributed training development can help build a much more comprehensive overall training system. Because it blurs those lines we currently have between individual and collective training, and between training and mission rehearsal. We have this split, a chasm that exists, that I just don't see as productive, and it's not an effective way of doing business. So, this I see as a potential way to really bring those together. Then the second thing is, I really believe that this is a way for training to make a greater contribution to readiness.
  - c. We may give up some quality for quick access, for some tailoring, for some modularity.
  - d. I think that the quality control and the quality assurance sometimes tends to be less when a contractor is doing it than when you are doing it yourself.
  - e. (Distributed training development needs) some type of evaluation process. It's the fox watching the henhouse. They pass out some questionnaires. Soldiers are conditioned that if the Army gives it to them, it must be OK. And you know this as well as anyone else. So if you ask a soldier a question the right way: Did you enjoy this? That's touchy-feely, that's not objective. What you're asking, would you rather be in the classroom, an air-conditioned, or environmentally controlled classroom, or out in the field learning this. You can make an evaluation. You tell people you're giving one, but if you don't design it properly, and you are going to prep the answers and you are going to get them back.
4. What part(s) of Systems Approach to Training (SAT) should be distributed?
  - a. Some of the task analysis and some design and development would be good.
  - b. All phases of SAT are applicable, however they must be adapted for use in a distributed environment.
  - c. I think that SAT process that stands to gain the most by being distributed is the analysis.

- d. Because the development part just really means filling in the blanks. You need that proponent to determine, for example, you've got to have a management training sequence. You can't distribute that.
5. What agencies should be involved in distributed training development activities?
- a. Broad scope: Schools and units must be involved. Combat Developers from schools and labs, ensure NET training adequate force development, Contractors supporting new equipment—to get needed equipment data.
  - b. Proponents and TSMs. The TSM should definitely take the lead when it comes to training development; however they must be given the assets to do this. In most cases the TSMs have authority to oversee the development of training, but have no resources to accomplish this (i.e., they theoretically can tell people what to do but really don't have the authority since the people developing the training work for the proponent and not for the TSM).
6. What references and tools are currently available? What additional tools and references are needed?
- a. The primary tools that I see are your automation tools, that's going to have more impact on how things look, how the processes are done, and how they are distributed than anything else
  - b. 350-70, ASAT software, Designer's Edge® software.
  - c. TRADOC Regulation 350-70, 350-70-2, Designer's Edge® and Toolbook® software.
7. How should distributed training development activities be controlled or managed/guided?
- a. Very carefully. Otherwise the effort and assets will be absorbed and we will not get any benefits.
  - b. Distributed training development should be managed by the TSM who should have control of or at least authority over the New Systems Training Office (NSTO).
  - c. The schools have the charge. If they have mechanisms and tentacles out as they should, as was designed, that's even better. But the schools have the charge until they have it taken away by TRADOC. And I don't think that's likely to happen.
8. Describe your office's specific role in distributed training development activities.
- a. Our office will get feedback from material developers and users and pass this on to the proponents. They will develop limited training products and staff them with both the proponent and users for approval.

- b. Team interacts closely with (training development agency) at (proponent school). School provides generalized guidance as to training development standards but allows the contractor a lot of latitude in design and development decisions. The team also deals in some respects with just about every PM. This is necessitated by the type of training they are developing (staff collective). Primary interface seems to be with PM and TSM.
9. What general improvements are needed to facilitate distributed training development activities?
- a. First and foremost find a smart colonel (O6) who is knowledgeable about the TRADOC training development process and give him control of all collective training development. Centralize the control of funding efforts so that funding priorities can be set rather than "salami slicing" of funds. Re-look the doctrine development process and ensure that the end users are in the loop. Ensure that contracting CORs and contracting officer's technical representative (COTRs) are knowledgeable about their projects and have sufficient stability to see the project through to completion. Finally, form a digital NET team which would be composed of the most knowledgeable military personnel and civilian contractors. The concept would be that this NET team would travel to digital equipment fielding locations and execute fielding in all areas from installation to individual and collective training to validation of unit competency to use their new digital equipment. This team would have already developed training packages which it would use to train all units.
  - b. Heal that broken line between PMs and TRADOC. (Respondent supplied figure in explanation. See Figure C-1.)
  - c. Train proponents to function in a distributed training development environment. Specifically how distributed training development is done, the benefits of using distributed training development, and the responsibilities that proponents have in the process.
  - d. The schools need to create a separate evaluation cell, not under the directorate of training. And I think that will help to have (to have a DOES-like organization). Because right now, especially if you start distributing this work out, you've got to make sure people follow the same process. The other thing that's important, too, is standardization and format.
  - e. If I was going to change anything, I would ask TRADOC to look at better educating the officers in the basic and advanced courses in training development and training development techniques. At least understanding the process. I can't think of any time I was ever taught that in any of the schools I went to. Certainly you can't turn everybody into training developers. But, if they understand what the idea behind it is, training is better. Everybody's a great trainer. But, there's a difference between going out and doing a movement to contact, kind of with that being the objective, as opposed to breaking it down into smaller tasks and objectives, and key events on that,



to really narrow your focus on what you are trying to train and how you evaluate what it is you are doing.

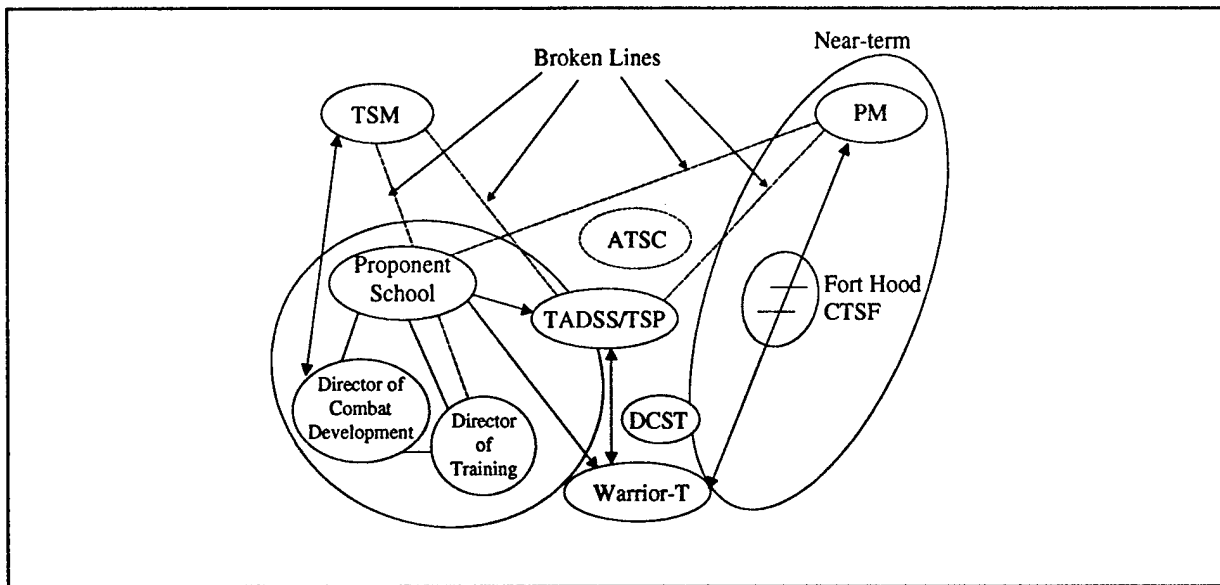


Figure C-1. "Broken lines" associated with distributed training development activities in an interview subject's drawing of distributed training development interaction.

Appendix D  
Related Reading

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